



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

SEP 17 2018

Mr. Thomas Frick  
Director  
Division of Environmental Assessment & Restoration  
Florida Department of Environmental Protection  
Mail Station 3000  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Dear Mr. Frick:

The U.S. Environmental Protection Agency has completed its review of the document titled *Nutrient TMDLs for Lake Alma (WBID<sup>1</sup> 2986D) and Lake Searcy (WBID 2986E) and Documentation in Support of Development of Site-Specific Numeric Interpretations of the Narrative Nutrient Criterion*. The Florida Department of Environmental Protection (FDEP) submitted the Lake Alma and Lake Searcy Total Maximum Daily Loads (TMDLs) and revised Chapter 62-304, Florida Administrative Code (F.A.C.),<sup>2</sup> including the numeric nutrient criteria (NNC) for the subject water, in a letter to the EPA dated June 13, 2018, as TMDLs and new or revised water quality standards (WQS) with the necessary supporting documentation and certification by the FDEP General Counsel, pursuant to Title 40 of the Code of Federal Regulations part 131.

The NNC were adopted under Chapter 62-304.505(22)-(23) as site specific numeric interpretations of paragraph 62-302.530(48)(b). As referenced in paragraph 62-302.531(2)(a), the FDEP intends for the submitted NNC to serve in place of the otherwise applicable criteria for lakes set out in paragraph 62-302.531(2)(b). The total nitrogen (TN) and total phosphorus (TP) TMDLs for Lake Alma, a revised chlorophyll *a* criterion for Lake Alma, and TN and TP TMDLs for Lake Searcy would also constitute site specific numeric interpretations of the narrative nutrient criterion set forth in paragraph 62-302.530(48)(b), for this water segment.

The FDEP submitted the Lake Alma and Lake Searcy TMDLs to the EPA for review pursuant to both Clean Water Act (CWA) sections 303(c) and 303(d) since the TMDL will also act as a Hierarchy 1 (H1) site-specific interpretation of the State's narrative nutrient criterion pursuant to 62-302.531(2)(a)1.a. The EPA acknowledges that by virtue of establishing the TMDL in chapter 62-304, the FDEP is also establishing an H1 interpretation of the narrative nutrient criterion for this waterbody as new or revised WQS. The enclosed combined WQS and TMDL decision document summarizes the EPA's review and approval of the WQS and TMDLs.

<sup>1</sup> WBID refers to waterbody identification

<sup>2</sup> Unless otherwise stated, all rule and subsection citations are to provisions in the Florida Administrative Code.

In accordance with sections 303(c) and (d) of the CWA, I am hereby approving the TMDLs promulgated in Chapter 62-304 for Lake Alma and Lake Searcy as both TMDLs and revised WQS for TN, TP and chlorophyll *a*. Any other criteria applicable to these waterbodies remain in effect, especially those related to chlorophyll *a* in paragraph 62-302.531(2)(b). The requirements of paragraph 62-302.530(48)(a) also remain applicable.

If you have any comments or questions relating to the approval of the H1 WQS or TMDLs, please contact me at (404) 562-9345, or have a member of your staff contact Dr. Katherine Snyder in the WQS program at (404) 562-9840 or Ms. Laila Hudda of the TMDL program at (404) 562-9007.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeaneanne M. Gettle".

Jeaneanne M. Gettle  
Director  
Water Protection Division

Enclosure

cc: Mr. Kenneth Hayman, FDEP  
Mr. Daryll Joyner, FDEP  
Ms. Erin Rasnake, FDEP

## **Florida Numeric Interpretation of the Narrative Nutrient Water Quality Criterion Through Total Maximum Daily Loads (TMDLs) to Establish a Hierarchy 1 (H1): Joint Water Quality Standards (WQS) and TMDL Decision Document**

**H1:** Nutrient TMDL for Lake Alma and Lake Searcy (waterbody identification (WBID) 2986D 2986E)

**ATTAINS TMDL ID:** FL68600

**Location:** Seminole County, Florida

**Status:** Final

**Criteria Parameter(s):** The Lake Alma TMDL allocation for WBID 2986D is 1,036 lbs/yr for total nitrogen (TN) and 91 lbs/yr for total phosphorus (TP) expressed as 7-year averages of annual loads, not to be exceeded. The chlorophyll *a* (Chl*a*) criteria for Lake Alma is 30 µg/L expressed as an annual geometric mean (AGM), not to be exceeded. The Lake Searcy TMDL allocation for WBID 2986E is 845 lbs/yr for total nitrogen (TN) and 96 lbs/yr for total phosphorus (TP) expressed as 7-year averages of annual loads, not to be exceeded.

**Impairment/Pollutant:** Lake Alma and Lake Searcy in the Middle St. Johns River Basin are not meeting water quality criteria for nutrients and not supporting the designated uses of Class III Freshwater (fish consumption; recreation; and propagation and maintenance of a healthy, well-balanced population of fish and wildlife). An H1 was submitted by the Florida Department of Environmental Protection (FDEP) that establishes site-specific criteria for TN, TP and Chl*a* and provides loads to address the impairment.

**Background:** The draft report for Lake Alma and Lake Searcy is dated August 2017 and was received on August 29, 2017. The final report dated March 2018 includes H1 target concentrations and loads. The FDEP submitted the final H1 for the *Nutrient TMDLs for Lake Alma (WBID 2986D) and Lake Searcy (WBID 2986E)* (the “report”) by letter dated June 13, 2018, and the letter and report were received on June 25, 2018.

The submission included:

- Submittal letter
- Nutrient TMDLs for Lake Alma (WBID 2986D) and Lake Searcy (WBID 2986E) and Documentation in Support of the Development of Site-Specific Numeric Interpretations of the Narrative Nutrient Criterion
- Documents related to Public Workshop
- Documents related to Public Hearing
- Documents related to Public Notice for Rulemaking and Rule Adoption
- Public Comments and Response

This document explains how the submission meets the Clean Water Act (CWA) statutory requirements for the approval of WQS under section 303(c) and of TMDLs under section 303(d), and the EPA’s implementing regulations in Title 40 of the Code of Federal Regulations (40 CFR) sections 131 and 130, respectively.

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Lake Alma (WBID 2986D) and Lake Searcy (WBID 2986E)/ Middle St. Johns Basin – Nutrients

**REVIEWERS:** WQS: Katherine Snyder, WQS Coordinator, [Snyder.Katherine@epa.gov](mailto:Snyder.Katherine@epa.gov)  
TMDL: Laila Hudda, TMDL Coordinator, [Hudda.Laila@epa.gov](mailto:Hudda.Laila@epa.gov)

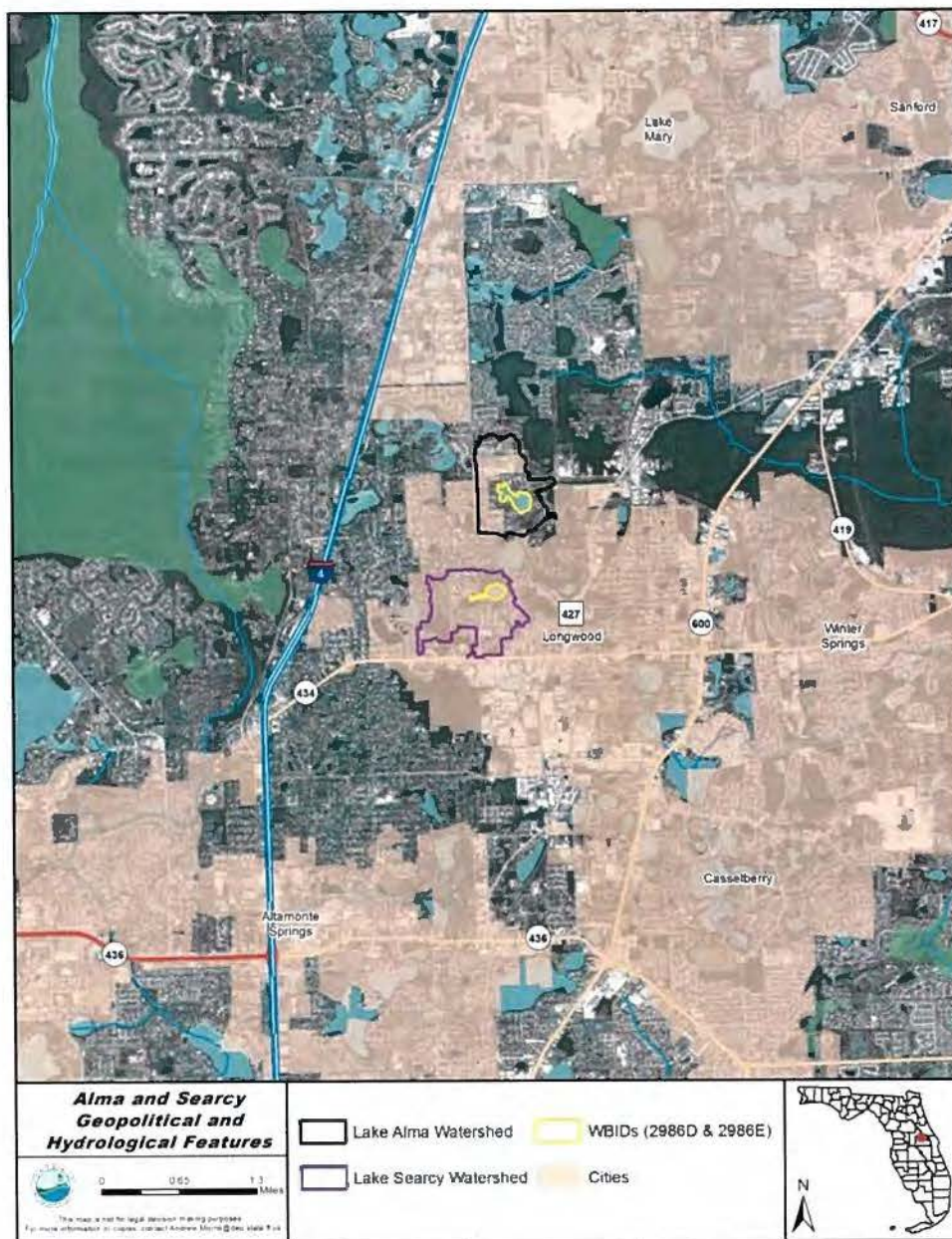


Figure 1. Lake Alma and Lake Searcy watershed.

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*This document contains the EPA's review of the above-referenced H1. This review document includes WQS and TMDL review guidelines that state or summarize currently effective statutory and regulatory requirements applicable to this approval action. Review guidelines are not themselves regulations. Any differences between review guidelines and the EPA's implementing regulations should be resolved in favor of the regulations themselves. The italicized sections of this document describe the EPA's statutory and regulatory requirements for approvable H1s. The sections in regular type reflect the EPA's analysis of the state's compliance with these requirements.*

#### **I. WQS Decision – Supporting Rationale**

*Section 303(c) of the CWA and the EPA's implementing regulations at 40 CFR section 131 describe the statutory and regulatory requirements for approvable WQS. Set out below are the requirements for WQS submissions, under the CWA and the regulations. The information identified below is necessary for the EPA to determine if a submitted WQS meets the requirements of the CWA and, therefore, may be approved by the EPA.*

##### **1. Use Designations**

*Section 131.10(a) provides that each state must specify appropriate water uses to be achieved and protected. The classification of the waters of the state must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. In no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the United States.*

**Assessment:** Lake Alma and Lake Searcy are classified as Class III Freshwater (fish consumption; recreation; and propagation and maintenance of a healthy, well-balanced population of fish and wildlife).

##### **2. Protection of Downstream Uses**

*Section 131.10(b) provides that in designating uses of a waterbody and the appropriate criteria for those uses, the state shall take into consideration the WQS of downstream waters and shall ensure that its WQS provide for the attainment and maintenance of the WQS of downstream waters.*

Rule 62-302.531(4) of the Florida Administrative Code (F.A.C.) requires that downstream uses be protected. There is no data to indicate discharge from Lake Alma, but according to the Lake Jesup Hydrologic Simulation Program – FORTTRAN (HSPF) model, Lake Alma and Lake Searcy discharge surface water to Soldier Creek (WBID 2986), a Class III freshwater stream. Based on the Group 2 assessment in 2016, Soldier Creek is not impaired for nutrients. Because the existing loads from Lake Searcy and Lake Alma to the creek have not led to a nutrient impairment in Soldier Creek, the reduction in nutrient loads in this report are not expected to cause nutrient impairments downstream. Soldier Creek discharges to surface water to Lake Jesup (WBID 2981). The existing nutrient concentrations in Soldier Creek are lower than the existing concentrations in Lake Jesup. The nutrient load reductions in Lake Alma and Lake Searcy described in this report are not expected to cause nutrient impairments downstream but will result in water quality improvements to downstream waters.

**Assessment:** The H1 is providing use protection for the downstream waters.

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### 3. Water Quality Criteria

*Section 131.11(a) provides that states must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. For waters with multiple use designations, the criteria shall support the most sensitive use.*

The FDEP used the Impaired Waters Rule (IWR) to assess water quality impairments in Lake Alma and Lake Searcy. Both lakes were verified as impaired for nutrients based on elevated annual average Trophic Status Index (TSI) values during Cycle 1 (January 1, 1996 – June 30, 2003) and subsequent assessments indicated that the numeric nutrient criteria (NNC) were also not being met. Under the revised NNC assessment methodology, Lake Alma was found to be impaired for Chl $a$ , TN, and TP. Lake Searcy was found to be impaired for Chl $a$  and TP.

To establish the nutrient targets for Lake Alma, the FDEP modeled Chl $a$  under natural background conditions and the model indicated natural background is higher than 20  $\mu\text{g/L}$  Chl $a$ . The 80th percentile geometric mean of the Chl $a$  concentration under the natural background condition was used as the TMDL target. The FDEP indicated that it is expected that the 80th percentile would be exceeded more than once (i.e., two or three times) in a three-year period only 10% of the time on a long-term basis, which represents an acceptable type I error rate.<sup>1</sup> To establish the nutrient targets for Lake Searcy, the FDEP did not have information to suggest that Lake Searcy differs from the lakes used as reference for development of the NNC, and therefore determined that the generally applicable NNC of 20  $\mu\text{g/L}$  Chl $a$  is appropriate. This level is considered protective of the designated use of this high-color lake. See 62-302.531(2)(b), F.A.C.

The TN and TP loads identified as the site-specific TN and TP interpretations of the narrative nutrient criterion were determined by using the HSPF watershed model and Environmental Fluid Dynamics Code (EFDC) and Water Quality Analysis Simulation Program (WASP) waterbody models to find watershed TN and TP loadings that will achieve the Chl $a$  targets for Lake Alma and Lake Searcy. Water quality data in the IWR Database (IWR\_Run 52) and rainfall and evapotranspiration data from the St. Johns River Water Management District (SJRWMD) were used for in-lake water quality calibration.

For the Lake Alma load reduction scenarios, the existing total TN and TP loads were iteratively reduced in the WASP model until the AGMs of simulated Chl $a$  did not exceed the target (30  $\mu\text{g/L}$ ). For the final load reduction scenario in Lake Alma, referred to as the TMDL condition, the existing TN and TP loads were reduced by 43 % and 17 %, respectively. For the Lake Searcy load reduction scenarios, the existing total TN and TP loads were also iteratively reduced until the AGMs of simulated Chl $a$  did not exceed the target (20  $\mu\text{g/L}$ ). For the TMDL condition in Lake Searcy, the existing TN and TP loads were reduced by 65 % and 38 %, respectively.

The TN and TP concentrations necessary for restoration are presented for informational purposes only and represent the simulated in-lake TN and TP concentrations corresponding to the target Chl $a$  concentrations of 30  $\mu\text{g/L}$  for Lake Alma and 20  $\mu\text{g/L}$  for Lake Searcy. The TN and TP restoration

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<sup>1</sup> FDEP. 2012. *Development of numeric nutrient criteria for Florida lakes, spring vents, and streams*. Technical support document. Tallahassee, FL: Division of Environmental Assessment and Restoration, Standards and Assessment Section.

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concentrations for Lake Alma are AGM concentrations of 1.41 mg/L and 0.13 mg/L, respectively and for Lake Searcy 0.45 mg/L and 0.05 mg/L, respectively.

**Assessment:** The Lake Alma TMDL allocation is 1,036 lbs/yr for TN and 91 lbs/yr for TP expressed as 7-year averages of annual loads, not to be exceeded. The loads were derived from watershed model TN and TP lake targets of 0.13 mg/L for TP and 1.41 mg/L for TN expressed as long term average AGMs.

The Lake Searcy TMDL allocation is 845 lbs/yr for TN and 96 lbs/yr for TP expressed as 7-year averages of annual loads, not to be exceeded. The loads were derived from watershed model TN and TP lake targets of 0.05 mg/L for TP and 0.45 mg/L for TN expressed as long term average AGMs.

The concentrations are given for comparative purposes only. The criteria are expressed as loads. The resulting water quality will protect the designated uses for this waterbody. Any other criteria applicable to this waterbody remain in effect, including the nutrient criteria for parameters set out in 62-302.531(2)(b) F.A.C.

### 4. Scientific Defensibility

*Section 131.11(b) provides that, in establishing criteria, states should establish numerical values based on 304(a) guidance, 304(a) guidance modified to reflect site-specific conditions, or other scientifically defensible methods.*

Lake Alma and Lake Searcy were verified impaired for nutrients based upon TSI data during the verified period ending in 2003 and based on subsequent assessments using the revised NNC assessment methodology.

For Lake Alma, this TMDL document based the TN and TP targets on the 80<sup>th</sup> percentile of natural background Chl<sub>a</sub> of 30 µg/l. The loads were derived from watershed model TN and TP in-lake targets of 0.13 mg/L for TP and 1.41 mg/L for TN expressed as long term average AGMs. The concentrations are given for comparative purposes only. These values correspond to long term (7-year) averages of annual loads of TN of 1,036 lbs/yr and TP of 91 lbs/yr, not to be exceeded. The resulting water quality is expected to protect the designated uses for this waterbody.

For Lake Searcy, this TMDL document based the TN and TP targets on the generally applicable Chl<sub>a</sub> criterion of 20 µg/l for high color lakes. The loads were derived from watershed model TN and TP in-lake targets of 0.05 mg/L for TP and 0.45 mg/L for TN expressed as long term average AGMs. The concentrations are given for comparative purposes only. These values correspond to long term (7-year) averages of annual loads of TN of 845 lbs/yr and TP of 96 lbs/yr, not to be exceeded. The resulting water quality is expected to protect the designated uses for this waterbody.

**Assessment:** The EPA determined that the selection of Chl<sub>a</sub> targets of 30 µg/L for Lake Alma and 20 µg/L for Lake Searcy as the response variable targets is appropriate and the technical approach to calculate the total watershed nutrient loads is scientifically sound. These approaches, which include the HSPF, EFDC, and WASP models to calculate the total watershed nutrient loads, are described in the report.

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### 5. Public Participation

*Section 131.20(b) provides that states shall hold a public hearing when revising WQS, in accordance with provisions of state law and the EPA's public participation regulation (40 CFR part 25). The proposed WQS revision and supporting analyses shall be made available to the public prior to the hearing.*

A public workshop was conducted by the FDEP on April 13, 2017, in Sanford, Florida to obtain comments on the draft nutrient TMDLs for Lake Alma and Lake Searcy. The workshop notice indicated that the nutrient TMDLs, if adopted, would constitute site-specific numeric interpretations of the narrative criterion set forth in paragraph 62-302.530(48)(b), F.A.C., that would replace the otherwise applicable NNC in subsection 62-302.531(2), F.A.C., for these waters. The FDEP also held a public hearing on September 29, 2017, in Casselberry, Florida.

**Assessment:** The FDEP has met the public participation requirements for this H1.

### 6. Certification by the State Attorney General

*Section 131.6(e) requires that the state provide a certification by the state Attorney General or other appropriate legal authority within the state that the WQS were duly adopted pursuant to state law.*

A letter from the FDEP General Counsel, Robert A. Williams, dated June 13, 2018, certified that the Lake Alma and Lake Searcy TMDLs were duly adopted as WQS pursuant to state law.

**Assessment:** The FDEP has met the requirement for Attorney General certification for this H1.

### 7. Endangered Species Section 7 Consultation

*Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the Services, to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species.*

The existing default NNC for the waterbody received concurrence by U.S. Fish and Wildlife Service (USFWS) on July 31, 2013. Because the site-specific criteria for TN and TP for Lake Alma in this report are within the default criteria and the site-specific criterion for TP for Lake Searcy in this report are within the default criteria, an additional ESA section 7 consultation for this standards action is not required.

USFWS provided concurrence with the EPA's programmatic consultation on site-specific nutrient criteria for Florida on July 21, 2015, for any site-specific nutrient criteria that are more stringent than the existing default nutrient criteria in place in the state of Florida for the waterbody. Because the site-specific criterion in this report for TN in Lake Searcy is more stringent than the default criteria, an additional ESA section 7 consultation for this standards action is not required.

The Chla criteria for Lake Alma is 30 µg/L, which is less stringent than the generally applicable criteria for Lake Alma. Based on USFWS official species list obtained on July 16, 2018, the only aquatic species in Lake Alma is the West Indian manatee. Based on email correspondence on July 23, 2018, with Channing St. Aubin, USFWS, and Heath Rauschenberger, USFWS, the manatee would not be present in Lake Alma because of the lake's lack of hydrologic connectivity to a larger river system. The

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wood stork is also identified on the species list as potentially being impacted by activities in or around Lake Alma. Because nutrient management concerns are not a major threat to the wood stork, the EPA has determined the change in nutrient water quality criteria will have No Effect on the wood stork. Therefore, additional ESA section 7 consultation for this standards action is not required.

**Assessment:** The EPA has met the ESA requirements for this action.

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### II. TMDL Review

*Section 303(d) of the CWA and the EPA's implementing regulations at 40 CFR Part 130 set out the statutory and regulatory requirements for an approvable TMDL. The following information is generally necessary for the EPA to determine if a submitted TMDL fulfills the legal requirements for approval under section 303(d) and the EPA regulations and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.*

#### 1. Description of Waterbody, Pollutant of Concern, and Pollutant Sources

*The TMDL analytical document must identify the waterbody as it appears on the state's 303(d) list, including the pollutant of concern. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for the EPA's review of the load and wasteload allocations, which is required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments or chlorophyll *a* and phosphorus loadings for excess algae.*

Lake Alma is a 3-acre lake located in the Soldier Creek watershed in unincorporated Seminole County, 15 miles north of Orlando. Lake Searcy is a 13-acre lake located a mile to the south of Lake Alma. Both lakes were verified as impaired for nutrients based on elevated annual average TSI values during Cycle 1 (verified period, January 1, 1996–June 30, 2003) for the Middle St. Johns Basin, a Group 2 basin. The Cycle 2 data were insufficient to calculate annual means in the verified period, but for both lakes the planning period assessment indicated potential impairments based on TSI exceedance. At the time of the Group 2 Cycle 3 assessments, the waterbodies were reevaluated using the NNC for lakes. Lake Alma was found to be impaired for Chl<sub>a</sub>, TN and TP and Lake Searcy was assessed as meeting the listing requirements for the planning list for Chl<sub>a</sub> and verified list as impaired for TP but not for TN. Details regarding the impairments are presented in Table 2.1 of the report. However, based on recent studies, the FDEP believed that a reduction of both nitrogen and phosphorus were necessary to control algal growth in aquatic systems. Hence both TN and TP reductions are prescribed for each lake in the TMDL.

As presented in Table 4.1 and Figure 4.2 of the report, the total area of the Lake Alma watershed is 258 acres. The dominant land use type is pasture, followed by medium-density residential and low-density residential. Overall, human land uses, including all the residential, commercial, industrial, and agricultural areas, occupy 222 acres of the watershed and account for 86% of the total watershed. The total area of the Lake Searcy watershed is 284 acres, the dominant land use type being medium-density residential, followed by wetlands. Overall, human land uses, including all the medium-density residential, commercial, industrial, and rangeland areas, occupy 218 acres of the watershed and account for 77% of the total watershed and no agricultural areas are reported for the watershed.

The report stated that no NPDES-permitted wastewater facilities were identified in Lake Alma and Lake Searcy. The stormwater collection systems in the Lake Alma and Lake Searcy watersheds are owned and operated by Seminole County and co-permittees (Florida Department of Transportation [FDOT] District 5 and the City of Longwood) and covered by an NPDES Phase I MS4 permit (FLS000038).

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Most of the nutrient loadings to Lake Alma and Lake Searcy come from nonpoint sources, including surface runoff, groundwater input and atmospheric deposition directly onto the surface of the lakes.

**Assessment:** The EPA concludes that the FDEP has adequately identified the impaired waterbodies, the pollutant of concern, and the magnitude and location of the pollutant sources.

### 2. Description of the Applicable WQS and Numeric Water Quality Target

*The TMDL submittal must include a description of the applicable state WQS, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the statewide antidegradation policy. Such information is necessary for the EPA's review of the load and wasteload allocations which is required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable WQS is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site-specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.*

As described in WQS review sections I-1 and I-3 of this document, Lake Alma and Lake Searcy are classified as Class III Freshwater (waterbodies with a designated use of fish consumption; recreation; and propagation and maintenance of a healthy, well-balanced population of fish and wildlife). The Class III water quality criterion applicable to the verified impairment (nutrients) for both waterbodies is Florida's narrative nutrient criterion in Paragraph 62- 302.530(48)(b), F.A.C. The adopted lake NNC include criteria for Chl<sub>a</sub>, TN, and TP, with the specific values depending on the color and alkalinity of a given lake. Table 3.1 lists the NNC for Florida lakes specified in Subparagraph 62-302.531(2)(b)1., F.A.C.

The TMDLs constitute the site-specific numeric interpretation of the narrative nutrient criterion set forth in Paragraph 62-302.530(48)(b), F.A.C., that will replace the otherwise applicable NNC pursuant to Paragraph 62-302.531(2)(a), F.A.C., for both lakes. For Lake Alma, 30 µg/L of Chl<sub>a</sub>, which is the 80th percentile of natural background condition and for Lake Searcy, Florida's default NNC of 20 µg/L of Chl<sub>a</sub>, was selected as the target. The site-specific interpretations of the narrative nutrient criterion for TN and TP were determined by model simulation as TN and TP loads that would achieve the in-lake Chl<sub>a</sub> criteria every year and were presented in Table 3.2 of the report. The simulated in-lake TN and TP concentrations corresponding to the target Chl<sub>a</sub> concentrations of 20 µg/L for Lake Searcy and 30 µg/L for Lake Alma necessary for restoration are AGM concentrations of 0.45 mg/L of TN and 0.05 mg/L of TP for Lake Searcy, and 1.41 mg/L of TN and 0.13 mg/L of TP for Lake Alma.

The detailed process for developing the applicable WQS and the water quality targets is explained in Chapters 3 and 5 of the report and is also summarized in section I-3 of this document.

**Assessment:** The EPA concludes that the FDEP has properly addressed its WQS when setting a numeric water quality target.

### 3. Loading Capacity - Linking Water Quality and Pollutant Sources

*As described in the EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. The EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating WQS (40 CFR section 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 CFR section 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable*

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*pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for the EPA's review of the load and wasteload allocations which is required by regulation.*

*In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 CFR section 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet WQS. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of WQS and will help in identifying the actions that may have to be undertaken to meet WQS.*

To determine the assimilative capacity of Lake Alma and Lake Searcy, and identify the maximum allowable TN and TP loadings from the watersheds, the FDEP used a combination of the HSPF model for watershed simulation, and EFDC and WASP models for waterbody simulation. These models were updated during the Basin Management Action Plan (BMAP) development for Lake Jesup and its watershed to address stakeholder-raised concerns about the Bathtub model used to develop the Lake Jesup TMDLs. The models focus on the in-lake processes such as nitrogen fixation and sediment flux, account for attenuation of nutrients in the watershed and better represent the distribution of nutrient loading throughout the watershed. Detailed model inputs and configurations are available in the final report (Tetra Tech 2017a).<sup>2</sup>

The process used for identifying water quality targets and establishing the nutrient TMDLs is explained in section 5.3 of the report and was summarized in the following four main steps:

- 1) Flows, TP and TN loadings from the Lake Alma and Lake Searcy watersheds were estimated using the HSPF model as detailed in chapter 4 of the report. The model also included atmospheric deposition directly onto the lake surface and input from Onsite Sewage Treatment and Disposal Systems. (OSTDS).
- 2) Watershed flows and loading estimates from all sources from the HSPF model were entered in the EFDC model and the WASP model, to establish the relationship between TN and TP loadings and in-lake TN, TP, and Chl<sub>a</sub> concentrations by calibrating the model against the measured in-lake TN, TP, and Chl<sub>a</sub> concentrations. The calibrated model was then used to predict in-lake existing TN, TP, and Chl<sub>a</sub> concentrations.
- 3) All human land uses in the watersheds were then converted to natural land uses in the HSPF model to simulate the natural background flow, TN and TP loadings. The output from the HSPF model was entered in the EFDC and WASP models. In-lake concentrations in the natural background condition were simulated and compared with the generally applicable NNC to determine the appropriate Chl<sub>a</sub> criterion for the TMDLs as explained in section I-3 of this document.
- 4) The TN and TP loads that achieved the Chl<sub>a</sub> criteria for each lake were considered the TMDLs for Lake Alma and Lake Searcy.

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<sup>2</sup> Tetra Tech, Inc. 2017a. *Hydrology and water quality modeling report for the Lake Jesup Watershed, Florida*. Report to the Florida Department of Environmental Protection, Tallahassee, FL.

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The nutrient TMDL values, which are expressed as a 7-year average load not to be exceeded, address the anthropogenic nutrient inputs that contribute to the exceedances of the Chl $a$  criterion. The maximum of the resulting 7-year averages of TN and TP loads were chosen as the site-specific interpretations of the narrative nutrient criterion. The TMDLs for TN and TP are 1,036 lbs/yr and 91 lbs/yr, respectively for Lake Alma and 845 lbs/yr and 96 lbs/yr, respectively for Lake Searcy.

The report stated that the assimilative capacity was based on annual conditions, rather than critical/seasonal conditions since the methodology used to determine assimilative capacity did not lend itself very well to short-term assessments and the FDEP was generally more concerned with the net change in overall primary productivity in the segment, which was better addressed on an annual basis.

**Assessment:** The EPA concludes that the loading capacity, having been calculated using the EPA-reviewed water quality models, and using observed concentration data and water quality targets consistent with numeric water quality criteria, has been appropriately set at a level necessary to attain and maintain the applicable WQS. The H1 is based on a reasonable approach for establishing the relationship between pollutant loading and water quality.

#### 4. Load Allocation (LA)

*The EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 CFR section 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 CFR section 130.2(g)). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.*

*If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable WQS, and all nonpoint and background sources will be removed.*

The report states that most of the nutrient loadings to Lake Alma and Lake Searcy come from nonpoint sources, including surface runoff, groundwater input, areas where best management practices (BMPs) are used, and atmospheric deposition directly onto the surface of the lakes. The Lake Jesup HSPF model provides the watershed inputs to the lakes from each of these sources. Tables 4.4a and 4.4b in the report provide a list of the total water flows into the Lake Alma and Lake Searcy watersheds by year and by source from the HSPF model. The TN inputs to Lake Alma and Lake Searcy were also provided by the HSPF model and are presented in Tables 4.5a and Table 4.5b of the report. Likewise, the TP inputs for these lakes are presented in Table 4.6a and Table 4.6b.

To achieve the load allocation (LA), current TN and TP loads require reductions of 43% and 17% for Lake Alma and 65% and 38% for Lake Searcy, respectively. As these percent reductions are for the total loads from all sources, and load reductions are not required from natural land uses, the percent reductions for anthropogenic sources may be greater. It should be noted that the LA may include loads from stormwater discharges regulated by the FDEP and the SJRWMD that are not part of the NPDES stormwater program.

**Assessment:** The EPA concludes that the LAs provided in the TMDL report are reasonable and will result in attainment of the WQS.

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### 5. Wasteload Allocation (WLA)

*The EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 CFR section 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable WQS, and all point sources will be removed.*

*In preparing the WLAs, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. However, it is necessary to allocate the loading capacity among individual point sources as necessary to meet the WQS.*

*The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the state will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.*

As stated in section 6.3 of the report, no NPDES-permitted wastewater discharges were identified in the Lake Alma and Lake Searcy watersheds. However, the stormwater collection systems in the watersheds, which are owned and operated by Seminole County and co-permittees (FDOT District 5 and the City of Longwood), are covered by an NPDES Phase I MS4 permit (FLS000038). The MS4 permittees are responsible for a 43% reduction in TN and a 17% reduction in TP from the current anthropogenic loading in the Lake Alma watershed and for a 65% reduction in TN and a 38% reduction in TP in the Lake Searcy watershed. It should be noted that any MS4 permittee is only responsible for reducing the anthropogenic loads associated with stormwater outfalls that it owns or otherwise has responsible control over.

**Assessment:** The EPA concludes that the WLAs provided in the TMDL report are reasonable and will result in the attainment of WQS. This is because the H1 accounts for all point sources discharging to impaired segments in the watershed and the WLAs require that TN and TP loads comply with the TMDL targets.

### 6. Margin of Safety (MOS)

*The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA section 303(d)(1)(C), 40 CFR section 130.7(c)(1)). EPA 1991 guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.*

As mentioned in section 6.4 of the report, consistent with the recommendations of the Allocation Technical Advisory Committee in 2001, an implicit MOS was used in the development of the Lake Alma and Lake Searcy TMDLs. The TMDLs were based on the conservative decisions associated with several modeling assumptions in determining assimilative capacity (i.e., loading and water quality response) for Lake Alma and Lake Searcy. TMDLs were determined as the maximum annual average loads of TN and TP from 7-year average loads to ensure that all exceedances of the nutrient targets are

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addressed, as well as modeled to attain the Chla in all years, for Lake Alma and Lake Searcy. The TMDLs were also developed using water quality results from both high- and low-rainfall years.

**Assessment:** The EPA concludes that the H1 incorporates an adequate margin of safety.

### 7. Seasonal Variation

*The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA section 303(d)(1)(C), 40 CFR section 130.7(c)(1)).*

AGM values for TN, TP, and Chla concentrations were calculated based on all sampling data for the year as presented in Tables 5.1a and 5.1b of the report. As prescribed in paragraph 62-302.531(6), F.A.C., related to the numeric interpretations of narrative nutrient criteria, to calculate an AGM for TN, TP, or Chla, there must be at least four temporally independent samples per year taken at least one week apart with at least one sample taken between May 1 and September 30 and at least one sample taken during the other months of the calendar year.

Monthly variations in TN, TP, (2004–14) and Chla (2009–14) concentrations measured in Lake Alma and Lake Searcy were analyzed and presented in Figure 5.4a and Figure 5.4b of the report. Although some seasonal fluctuations were noted in all pollutant concentrations, section 5.3.7 of the report states that the estimated assimilative capacity is based on annual conditions, rather than critical/seasonal conditions as mentioned in section II-3 above.

Hence, although there is not a seasonal critical condition associated with the TMDL values, they are based on a 7-year rolling average of annual loads and this level of loading would make it unlikely that the Chla criterion, which was determined to be protective year-round, will be exceeded more than once every three years.

**Assessment:** The EPA concludes that seasonal variations were considered and that the H1 allocations ensure protection of WQS throughout all seasons.

### 8. Monitoring Plan to Track TMDL Effectiveness

*EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions, and such a TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDLs are occurring and leading to attainment of WQS.*

The report mentions that Seminole County and Lake Watch were already actively involved in data collection and analysis and that the organizations would continue to carry out monitoring activities in the lakes to evaluate future water quality trends. The data collected would be used to evaluate the effect of BMPs implemented in the watersheds on lake TN and TP concentrations.

It is mandatory for NPDES permittees discharging to these lakes to act to address the TMDL, unless they already have management actions defined in a BMAP. A BMAP developed by FDEP or a local

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entity that is adopted by the FDEP Secretary becomes legally enforceable. Water quality monitoring and project tracking plans are an integral part of the BMAP.

**Assessment:** Although not a required element of the EPA's TMDL approval process, the FDEP indicated that several stakeholders would be carrying out monitoring activities in Lake Alma and Lake Searcy, which would help to gauge the progress toward attainment of WQS. The EPA is taking no action on the monitoring plan.

### 9. Implementation Plans

*On August 8, 1997 Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with states to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist states in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in the TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by the EPA, they help establish the basis for the EPA's approval of the TMDL.*

The report discusses various mechanisms that are used to implement a TMDL which may occur through specific requirements in NPDES wastewater and MS4 permits, and through local or regional water quality initiatives or BMAPs. Facilities with NPDES permits that discharge to the TMDL waterbody must respond to the permit conditions that reflect target concentrations, reductions, or WLAs identified in the TMDL. As specified in the H1, Florida implements statewide regulations to address the issue of nonpoint source pollution by requiring new development and redevelopment to treat stormwater before it is discharged. The stormwater treatment requirements are integrated with other stormwater flood control requirements of the water management districts. The State's water management districts are also required (Chapter 62-40, F.A.C.) to establish stormwater Pollution Load Reduction Goals (PLRGs) and adopt them as part of a Surface Water Improvement and Management plan, another watershed plan, or rule. PLRGs are a major component of the load allocation part of a TMDL.

The report also mentions that since a BMAP is already adopted in May 2010 for Lake Jesup in the Middle St. Johns River Basin, the TMDLs for Lake Alma and Lake Searcy may be incorporated into this effort.

**Assessment:** Although not a required element of the TMDL approval, the FDEP discussed how information derived from the TMDL analysis process will be used to implement BMPs that support implementation of the TMDL. The EPA is taking no action on the implementation portion of the submission.

### 10. Reasonable Assurances

*EPA guidance calls for reasonable assurances when the TMDL is developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for the EPA to determine that the load and wasteload allocations will achieve WQS.*

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*In a waterbody impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, states are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in state implementation plans and "may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs."*

Restoration activities developed and implemented in Lake Alma and Lake Searcy watersheds, would depend heavily on the active participation of the SJRWMD, the FDOT, Seminole County Public Works, the City of Longwood, businesses, and other stakeholders. As mentioned in section 7.3 of the report, the FDEP is working with these organizations and individuals to undertake reductions in the discharge of pollutants and achieve the established TMDLs for Lake Alma and Lake Searcy. Seminole County and Lake Watch have already been actively involved in data collection and analysis. Several of the above-mentioned stakeholders have attended public meetings related to the TMDL development which demonstrates their commitment to restoring the water quality of Lake Alma and Lake Searcy.

**Assessment:** The EPA considered the reasonable assurances contained in the report. Point sources are required to comply with their NPDES permits, which must include the requirements and assumptions of the H1. Reductions for nonpoint sources are expected to occur as a result of the incentive and voluntary programs that were already in place or will be developed as part of the BMAP with active participation of its stakeholders.

## 11. Public Participation

*EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each state must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 CFR section 130.7(c)(1)(ii)). In guidance, the EPA has explained that the final TMDL submitted to the EPA for review and approval must describe the state's public participation process, including a summary of significant comments and the state's responses to those comments. When the EPA establishes a TMDL, EPA regulations require the EPA to publish a notice seeking public comment (40 CFR section 130.7(d)(2)).*

*Inadequate public participation could be a basis for disapproving a TMDL; however, where the EPA determines that a state has not provided adequate public participation, the EPA may defer its approval action until adequate public participation has been provided for, either by the state or by the EPA.*

A public meeting to explain the process of the TMDL development was held on April 13, 2017, and a notice of development of rulemaking to initiate TMDL development was published in the Florida Administrative Register (FAR) Volume 43, Number 62, March 30, 2017. Notice of a public workshop to be conducted by the FDEP on September 29, 2017, in Casselberry, Florida, to obtain comments on the draft nutrient TMDL for impaired waterbodies in Middle St. Johns River Basin was published in the Orlando Sentinel on September 18, 2017, and in the FAR Volume 43, Number 168, August 29, 2017. The FDEP reported that no written comments were received for Lake Alma and Lake Searcy during the public workshop. A notice of proposed rule to adopt the TMDLs (which would also constitute site-specific numeric interpretations of the narrative nutrient criterion set forth in paragraph 62-302.530(48)(b), F.A.C.,) was published in the FAR Volume 43, Number 246, December 22, 2017, and a public hearing was held on February 9, 2018, in Tallahassee, Florida.

**Assessment:** The EPA concludes that the State involved the public during the development of the H1, and provided adequate opportunities for the public to comment on the report.

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### 12. Submittal Letter

*A submittal letter should be included with the TMDL analytical document and should specify whether the TMDL is being submitted for a technical review or is a final submittal. Each final TMDL submitted to the EPA must be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under section 303(d) of the CWA for EPA review and approval. This clearly establishes the state's intent to submit, and the EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final submittal, should contain such information as the name and location of the waterbody and the pollutant(s) of concern.*

**Assessment:** Accompanying the State's final TMDLs (dated March 2018) for nutrients was a submittal letter from the FDEP General Counsel, Robert A. Williams, dated June 13, 2018, requesting the review and approval of the nutrient TMDLs for Lake Alma (WBID 2986D) and Lake Searcy (WBID 2986E).

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### III. Conclusion

The Water Protection Division is **APPROVING** the H1 NNC and TMDLs addressed by this decision document in accordance with sections 303(c) and 303(d) of the CWA, as consistent with the CWA and 40 CFR parts 131 and 130, respectively.

The H1 NNC presented in this decision document will constitute the site-specific numeric interpretation of the narrative nutrient criterion set forth in paragraph 62-302.530(48)(b), F.A.C., that will replace the otherwise applicable numeric criteria for TN and TP in subsection 62-302.531(2) for these particular waters, pursuant to paragraph 62-302.531(2)(a)1.b., F.A.C. Based on the chemical, physical, and biological data presented in the development of the H1 NNC outlined above, the EPA concludes that the revised NNC for Chl $a$ , TN, and TP provide for and protect healthy, well-balanced, biological communities in the waters to which the NNC apply and are consistent with the CWA and its implementing regulations at 40 CFR 131.11.

Therefore, the revised nutrient criteria for TN, and TP for Lake Alma are 1,036 lbs/yr for TN, and 91 lbs/yr for TP expressed as 7-year averages of annual loads, not to be exceeded. The revised Chl $a$  criterion for Lake Alma is 30  $\mu$ g/L, not to be exceeded. The revised nutrient criteria for TN, and TP for Lake Searcy are 845 lbs/yr for TN and 96 lbs/yr for TP expressed as 7-year averages of annual loads, not to be exceeded. All other criteria applicable to these waterbodies remain in effect, including other applicable criteria at 62-302.531(2)(b), F.A.C. The requirements of paragraph 62-302.530(48)(a), F.A.C. also remain applicable.

Furthermore, after a full and complete review, the EPA finds that the H1 for Lake Alma and Lake Searcy/ Middle St. Johns River Basin for TN, TP, and Chl $a$  satisfies all the elements of approvable TMDLs. This approval is for the *Nutrient TMDL for Lake Alma (WBID 2986D) and Lake Searcy (WBID 2986E)* addressing two waterbodies for use impairments due to nutrients based on elevated Chl $a$  and TN and/or TP values.

